The functionality of Pigments in Color Cosmetics
The functionality of Pigments in Color Cosmetics

**Color Definition**
- Color Wheel
- Color System

**Pigments**
- Definition
- Pigments & Science
Color Definition – Color Wheel

**Cool Colors**
- Cold
- Tranquility
- Mystery
- Sadness
- Darkness

- Remind us of: ice, cold, winter, death

**Warm Colors**
- Bright
- Warmth
- Passionate
- Energetic
- Tend to be eye-popping

- Remind us of: sun, love, fire, festivities
**PRIMARY COLORS:**

**Red, Yellow, Blue**

- These three primary colors are the **foundation** of the color wheel.
- Their true color **cannot be created** by mixing any other combination of colors.
- **All other colors in the color wheel are derived** from these three color hues.
SECONDARY COLORS: Violet, Orange, Green

These secondary color hues are created by mixing two primary colors together.

Red + Blue = Violet
Red + Yellow = Orange
Blue + Yellow = Green
TERTIARY COLORS:
- These are the colors formed by mixing a primary and a secondary color.
- That’s why the hue is a two word name, such as blue-green, red-violet, and yellow-orange.
Munsell Color System

• Visually identify and match color using a scientific approach.

• Developed by Albert H. Munsell who wished to create a “rational way to describe color.”

• System uses decimal notation rather than color names.

• Three dimensions of Color Space:
  - HUE = COLOR
  - VALUE = BRIGHTNESS
  - CHROMA = SATURATION
• **VALUE**
  • *how light or dark a color is*
  • scale runs vertically and moves from lightest (at the top) to darkest (at the bottom)
  • 0 pure black to 10 for pure white

• **CHROMA**
  • *how weak or strong a color is*
  • scale runs horizontally and moves from weak (from the left) to strong (to the right)
Color System – Example of Black Iron Oxides
Pigment versus Dye

DYE

- Soluble
  - Water
  - Oil
- Transparent solution
- Sensible to light, heat and pH
- Natural & Synthetic

PIGMENT

- Insoluble
- Dispersible
  - Water
  - Oil
- Opacity
- Natural & Synthetic
- Made by absorbing the dye on a substrate.
Pigment Families

MINERAL PIGMENTS
- Titanium Dioxide
  - Rutile: more opaque, more yellow
  - Anatase: more transparent, whiter
- Zinc Oxide
- Iron Oxides: Yellow, Red, Black
- Chromium Oxide (Green)
- Ultramarines (Pink or Blue)
- Manganese Violet

ORGANIC PIGMENTS
- Red 6 Lake
- Red 7 Lake
- Red 28 Lake
- Red 30 Lake
- Red 33 Lake
- Red 40 Lake
- Blue 1 Lake
- Yellow 5 Lake
- Yellow 6 Lake

NATURAL PIGMENTS
- Carmin
- Carbon Black
Application Type:
- Face
- Lips
- Eyes

Country Regulation
Modification of Technical Properties through Surface Treatment

- Hydrophobicity
- Oil Absorption
- Process Improvement
  - No grinding/milling necessary
  - Better Binding property
  - Easy Pouring
- Aesthetics
  - Visual Effect
  - Sensoriality
Modification of Technical Properties:

Contact Angle (Goniometer):
DETERMINES HYDROPHOBICITY

SuperHydrophobic $\Theta > 150$  Hydrophobic $90 < \Theta < 150$  Hydrophilic $\Theta < 90$
Modification of Technical Properties:
Hydrophobic to hyperHydrophobic

IMPROVES LONG WEAR
Modification of Technical Properties:

**Oil Absorption** ➔ **FLUID & LIGHT TEXTURES**

- Untreated Pigment Blend in CCT (50/50)
  - Viscosity: 144,000 cps

- Untreated Pigment Blend + Oil used in surface treatment added separately in CCT (50/50)
  - Viscosity: 104,000 cps

- Surface Treated Pigment Blend in CCT (50/50)
  - Viscosity: 5,950 cps
Modification of Technical Properties:

*Oil Absorption* ➔ *FLUID & LIGHT TEXTURES*

**Viscosity of 50% TiO₂ in Different Vehicles**

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<th>HLC</th>
<th>BA</th>
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Modification of Technical Properties:

Surface Treatment
No grinding/milling necessary

DIRECT INCORPORATION
EASY SHADE ADJUSTMENT
FASTER PROCESS

15% Pigments added into O/W emulsion

Untreated Pigments
Treated Pigments
Modification of Technical Properties:
Surface Treatment in Pressed Powders

**BETTER BINDING PROPERTY - LESS BINDER NECESSARY**
CAN ACHIEVE HIGH PEARL CONTENT

Drop Test
5 times at 45cm

15% of Untreated Pearls
+ 2% Binder

15% of Treated Pearls
+ 2% Binder
Modification of Technical Properties:

Surface Treatment

EASY POURING *(Lipstick, Hot Pour)*
HIGHER COVERAGE POSSIBLE

15% Pigments (Red 6 Lake) in Lipstick formulation
Modification of Technical Properties:
Surface Treatment

PREMIUM VISUAL EFFECT

Untreated Pearls
Treated Pearls

Agglomerates

5 min of mixing
10 min of mixing
Modification of Technical Properties:

Surface Treatment

DIRECT IMPACT ON FEEL OF FINAL PRODUCT

- Liquid Foundation:
  - 15 to 20% pigments: give color and shade desired but not only:
    - Bring unique sensoriality
    - Allow new texture and feel
    - Improve performance of final product

- Pressed Powders:
  - Pigments
  - Fillers
  - Pearls
SENSIENT Technologies – How we can help you!

Marketing Claims

Right Choice of Surface Treatment

Formulation
SENSIENT Technologies – How we can help you!

Surface Treatment Technology
- Surface modification
- Wettability modification

- **Pigment**
  - Water resistance
  - Hydrophobic substances
  - Hydrophilic substances
  - Hydrophobic and lipophobic substances

- **Pigment**
  - Skin compatibility
  - Long wear

- **AS**
- **ADT-C**
- **HLC**
- **BA**
- **PHY**
- **FSP**

Water
Oil
Hydrophobic Surface Treatments

ADT-C
High Color Deposition
and Long Wear Performance

HLC
Natural and Creamy Feel

BA
Natural High Load
and Lightweight Feel
Hydrophilic Surface Treatments

Light and fresh formulations!
Possibility to innovate and create new textures!

PHY
Natural and Direct Incorporation in water

AQ
Dispersible in water with Better Suspension Property
Thank you!

Any further question?

Feel free to contact me!

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